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ABSTRACT

Summarized are results of a survey of Tennessee teachers, elementary school principals, and supervisors of instruction regarding their views of environmental education and its implementation. Of the possible respondents, 35.4% returned the survey questionnaire. Frequency tabulations, percentages, and means show that environmental education is overwhelmingly perceived as an important component of the public school curriculum. In a majority of cases, educators integrate environmental education into other school subjects and incorporate both field trips and school site studies into their teaching activities. Over 70% of respondents indicated that environmental education programs should focus on the pre-adult level. Also presented in this report are a copy of the survey questionnaire, a discussion of limitations of the research methodology, conclusions regarding perceived problems in teaching environmental education, and respondents' opinions about the subject areas that relate most to environmental education. (WB)

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STATUS OF ENVIRONMENTAL EDUCATION IN TENNESSEE

A Paper

by

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INTRODUCTION

Man's concern with his environment is nothing new. As early as 1891, Wilbur Jackson's Nature Study for the Common School launched a nature study movement which took students outdoors to explore an indivisible environment with an integrated approach. Not long after Jackson's start President Theodore Roosevelt sparked a trend that led to the reverse of wastefulness that had been prevalent for the past 300 years. Soon to follow was Aldo Leopold with his thought provoking ideas. Rachel Carson's The Silent Spring awakened many a sleeping mind. Still many people fail to realize that the most important discovery of the twentieth century is not the discovery of the atom, not the advent of the transistor but the realization that all living things are interdependent. As the world becomes more crowded and complex these interdependents become more important.

Where does the responsibility for environmental decisions rest? It rests with each individual. Each individual must be equipped to perceive and then to evaluate each set of environmental circumstances as a new challenge. Each individual must become aware of the interrelationship and interdependency that exists between the biological and physical aspects of the environment. He must realize that alternatives do exist within our environment and be equipped to choose the

most logical alternative. He must also be able to provide leadership to those who are unaware of the environmental problems that exist. It is the educational community's responsibility to see that he is able to meet these environmental concerns.

Since environmental education touches every aspect of living and learning, an environmental education program must not be approached as a separate subject, but diffused into curriculum. An environmental education program must provide the learner with meaningful, realistic experiences so that he will be able to identify his role in the ecosystem. This identification must become an automatic and self-committed process.

Whose responsibility is it to first awaken each individual? It is the responsibility of the educator. Their support of environmental measures should be based not only on national, social, political and economic reasons, but moral sense of waste and a need for stewardship.

This study was an attempt to determine how educators across Tennessee feel about the importance of environmental education and their determination in implementing it. The following presentation indicates the reflections of 1035 pre-college educators from throughout Tennessee. Hopefully these results will serve as information to institutions, organizations and agencies for providing additional training opportunities in environmental education. That was one of the major purposes for the investigation.

RESEARCH METHOD AND PROCEDURE

The population for this study was the professional staff of teachers, elementary principals, and supervisors of instruction in the State of Tennessee. A sample was chosen from the Directory of Public Schools for the State of Tennessee which included 271 elementary principals, 946 science teachers middle grades through high school, and 218 supervisors of instruction. Each of the 271 elementary principals was mailed a questionnaire and postage paid preaddressed envelope for himself and two teachers; one from grades K-3 and the other 4-6. Each of the 946 science teachers was given an additional questionnaire and envelope and asked to disseminate it to a social studies teacher in the same school. Returns were received from 1035 of the 2923 possible, a 35.41 percent reply. The count per subgroup was as follows: elementary teachers k-3 - 144; elementary teachers 4-6 - 127; middle or junior high school science teachers - 172; middle or junior high school teachers of social studies - 94; senior high school teachers of science 9-12 - 170; senior high school teachers of social studies 9-12 - 54; elementary principals- 136; supervisor of instruction - 92; and other or no identification - 46.

The data were analyzed at the D.W. Mattson Computer Center at Tennessee Technological University. Frequency tabulations and percentages were calculated for all of the 50 items on the questionnaire. Means were computed for items 9 through 40. (See questionnaire in Appendix) The analysis

of variance procedure was utilized in testing null hypotheses for all comparisons between subgroups. (These results are not presented in this report.)

PRESENTATION OF FINDINGS

To the question, "Do you believe environmental related problems indicate a need for teaching environmental education in public education?", 93.9 percent responded yes. The respondents to the questionnaire indicated that only 31.2 percent of them had studied environmental education in a college setting while 35.1 percent indicated they had participated in workshops or inservice programs related to environmental education. Of those who had participated in workshops or inservice programs it was determined that 15.3 percent had received support from the National Science Foundation and another 4.0 percent had received support from a grant from Health, Education, and Welfare. Another 25.6 percent indicated they received support from other sources. Fifty-five percent of the group indicated they received no financial support. Thus, a total of 45 percent of those who attended workshops and inservice training had received financial assistance from some source. Yet, over 60 percent of the total group indicated no training whatever in environmental education.

When asked the question, "Which pattern of environmental education best describes that used in your school?", 6.1 percent indicated a separate course was taught; 59.2

percent indicated that environmental education was integrated into other subjects; 28.1 percent indicated that incidental instruction was provided; and 6.5 percent indicated that it was not taught. The respondents overwhelmingly indicated that the State Department of Education should strongly encourage the development of environmental education programs in the schools with an 85.4 percent agreement with the item.

When asked the types of environmental activities being employed in their school, 61.9 percent of the respondents indicated they were using field trips; 54.5 percent indicated the use of outdoor programs on school sites; 7.6 percent were utilizing Tremont, 10.0 percent indicated they were utilizing Land-Between-The-Lakes, 14.2 percent indicated they were utilizing another residence program, and 68.2 percent indicated they were not utilizing residence programs. Only 8.6 percent of the group indicated their school was not using films on environmental education with over 20 percent indicating they used ten or more films per year; and over 70 percent of the respondents indicated they were utilizing resource persons in environmental education.

Over 70 percent of the sample who responded to the questionnaire indicated they thought environmental education programs should focus on the pre-adult level. Only 1.6 percent of the group indicated that the primary focus should be at the adult level while another 26.2 percent indicated that it should be emphasized at all levels, K-adult. The largest single response of 31.3 percent indicated that the primary

focus for environmental education should be at the middle or junior high school level.

There was a very positive response to items relating to further study and involvement with environmental education. Over 50 percent of the group indicated they would like further information relating to a residence center operation; 53.2 percent of the group indicated they were interested in participating in a workshop or inservice opportunity in environmental education; 35.8 percent said they were not aware of the Tennessee Environmental Education Association (TEEA) but were interested in it; and another 20.3 percent indicated an awareness of the TEEA while only 1.6 percent indicated membership in it. The results indicate that there are a large number of school personnel who have an interest in environmental programs and organizations.

One of the main parts of the questionnaire dealt with difficulties associated with teaching environmental education. The respondents were asked to rate the levels of importance to the several problem areas facing implementation of environmental education programs. Table I includes the ranking from highest area of difficulty to lowest (based upon a scale of 5 = highest and 1 = lowest). As noted in Table I the areas of most concern relate to preparation of teachers in environmental education and inadequate inservice training opportunities in environmental education. The respondents also believe there is a lack of appropriate curriculum materials on

TABLE I

MEAN RANKING OF PROBLEM AREAS RELATING TO THE TEACHING OF ENVIRONMENTAL EDUCATION

Rank	Problem Area	Mean Ranking
1	Preparation of teachers in environmental studies	3.75
2	Inadequate inservice training in environmental education	3.69
3	Lack of appropriate curriculum materials	3.63
4	Potential legal problems associated with transporting and supervising students in out of school areas	3.60
5	Present day stress on back to the basics and competency testing	3.50
6	Rigidity of the school schedule	3.36
7	Lack of support from state and other governmental agencies	3.33
8	Insufficient room in our present school curriculum	3.16
9	Confinement of students in the classroom	3.04
10	Lack of acceptance by the general public	2.88
11	Lack of acceptance by teachers	2.82
12	Insufficient student interest	2.63

environmental education. Problems associated with legal concerns and the back to basics issue were also noted as important areas of difficulty. Interestingly, the area of least importance as a difficulty associated with implementing environmental education was insufficient student interest.

The question of what subject area is of most importance in regard to the teaching of environmental education constituted another major portion of the investigation. The respondents ranked the several discipline areas on a scale ranging from 5 (very important) to 1 (not important) on the question of which should receive the greatest emphasis in environmental education. The results of the analysis depicted

in Table II indicate that the science areas, especially the earth sciences and biological sciences, are considered as most important for environmental education. The physical sciences and health were also ranked highly on the scale. Though much emphasis has been placed on the need to integrate environmental education into all areas of the curriculum, the ranking for a new course in environmental education was fifth with a mean of 3.91 on the five point scale. Vocational home economics and agriculture and geography were also indicated as important areas of emphasis for environmental education. Moderate rankings were given for a number of other areas such as the social sciences and industrial arts with low rankings given to the humanities, mathematics, business education, physical education and special education.

TABLE II

RANKING OF EMPHASIS ON ENVIRONMENTAL EDUCATION BY DISCIPLINE AREA

Rank	Discipline Area	Mean Ranking
1	Earth Sciences	4.48
2	Biological Sciences	4.36
3	Physical Sciences	4.14
4	Health	4.13
5	A New Course in Environmental Education	3.91
6	Vocational Home Economics and Agriculture	3.89
7	Geography	3.77
8	Sociology	3.51
9	Economics	3.49
10	Vocational Industrial Areas	3.47
11	Civics, Government, Political Science	3.41
12	History	3.02
13	Special Education	2.86
14	Physical Education	2.81
15	Art	2.71
16	Mathematics	2.68
17	Language Arts	2.67
18	Business Education	2.59
19	Literature	2.57
20	Music	2.23

SUMMARY AND CONCLUSIONS

Educators in the State of Tennessee perceive environmental education as an important component of the curriculum. They still view it as being most associated with the implementation of environmental education into the curriculum. Some of these relate to teacher training and curriculum development while many related to such areas of concern as legal problems and back to the basics. In general, educators in Tennessee want more opportunities for involvement in environmental education and are interested in participating in workshops or inservice programs relating to it.

Some of the problems associated with dispensing the questionnaire resulted in a low return of response. It can not be determined what the effect of mailing out the questionnaires in bulk rate format had on the percentage of returns. Also, it may be possible that those who returned the questionnaire were more interested in the area of environmental education than those who did not. The results from this study must be limited to the 1035 educators who responded to the questionnaire. The 35 percent return is insufficient to draw inference to the total population of educators in Tennessee. Also, another limitation should be considered when interpreting results on ratings in the areas of the secondary curriculum other than science and social science - there was no representation from the other areas since the sample was not selected from all areas of the curriculum. It is

recommended that similar studies be completed in other states with better sample selection in the secondary curriculum areas. Though there are definite limitations to this study, it indicates considerable interest in environmental education in Tennessee.

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APPENDIX A

ANALYSIS OF VARIANCE RESULTS ON COMPARISON BY TEACHING POSITION

TABLE III

ANALYSIS OF VARIANCE RESULTS ON COMPARISON BY TEACHING POSITION

Item	N of Cases	Subgroup Means: Elem. Tchr. K-3	Elem. Tchr. 4-6	Jr. High Science	Jr. High S.S.	Sr. High Science	Sr. High S.S.	Elem. Prin.	Supv. Instr.	Other	F-Ratio	DF B	DF W	Sign. Level
Insufficient room in our present school curriculum	985	3.41	3.35	2.99	3.10	2.75	3.02	3.27	3.46	3.45	4.70	8	976	.000
Preparation of teachers in environmental studies	991	3.72	3.78	3.79	3.62	3.46	3.80	3.78	4.05	3.93	2.88	8	982	.004
Lack of appropriate curriculum materials	987	3.81	3.60	3.60	3.73	3.47	3.68	3.52	3.72	3.83	1.39	8	978	.199
Confinement of students in the classroom	977	2.78	3.15	3.30	3.03	3.15	3.25	2.91	2.74	3.20	3.13	8	968	.002
Lack of acceptance by teachers	987	2.99	2.82	2.71	2.69	2.66	2.83	2.82	2.99	5.38	2.48	8	978	.012
Lack of acceptance by general public	983	2.89	2.95	2.79	2.93	2.80	3.09	2.80	2.84	3.17	.91	8	974	.504
Lack of support from State & Governmental Agencies	976	3.12	3.27	3.36	3.31	3.28	3.62	3.42	3.41	3.68	1.77	8	967	.080
Rigidity of the school schedule	986	3.23	3.22	3.54	3.40	3.47	3.49	3.12	3.32	3.82	2.25	8	977	.022
Insufficient student interest	986	2.69	2.27	2.63	2.59	2.82	2.92	2.39	2.65	3.17	4.44	8	977	.00
Back to Basics & Competencey Testing	987	3.64	3.64	3.35	3.34	3.15	3.56	3.53	3.93	3.55	3.75	8	978	.00
Inadequate Inservice Training in Environmental Educ.	990	3.87	3.53	3.72	3.62	3.64	3.77	3.67	3.70	3.89	1.02	8	981	.417
Potential legal problems in transport	983	3.75	3.58	3.68	3.58	3.77	3.54	3.16	3.53	3.82	2.77	8	974	.005
Art	904	2.94	2.95	2.53	2.64	2.44	2.56	2.85	2.55	2.71	3.49	8	895	.001
Music	894	2.62	2.58	2.03	2.08	1.86	1.93	2.44	2.11	2.25	8.31	8	895	.000
Health	946	4.09	4.06	4.26	4.04	4.14	4.13	4.06	4.10	4.10	.65	8	937	.738
Biology Sciences	958	4.20	4.19	4.56	4.20	4.66	4.36	4.18	4.29	4.41	6.08	8	949	.000
Physical Sciences	946	3.97	4.00	4.12	3.92	4.28	4.42	4.28	4.04	4.32	2.83	8	937	.004
Earth Sciences	975	4.30	4.45	4.52	4.31	4.58	4.73	4.47	4.51	4.44	2.27	8	966	.021
Mathematics	911	2.74	3.07	2.56	2.67	2.46	2.04	2.70	2.65	3.00	3.92	8	902	.000
Vocational Industrial Areas	904	3.55	3.32	3.40	3.24	3.67	3.46	3.40	3.48	3.71	1.55	8	895	.135
Vocational Home Economics & Agriculture	922	3.87	3.72	3.94	3.85	4.07	3.86	3.73	3.90	4.17	1.70	8	913	.095
Sociology	917	3.45	3.41	3.46	3.67	3.66	4.06	3.33	3.42	3.35	2.90	8	908	.004
Language Arts	904	2.96	2.94	2.55	2.67	2.29	2.29	2.76	2.66	2.82	4.62	8	895	.000
Literature	895	2.71	2.70	2.48	2.57	2.38	2.45	2.59	2.39	2.71	1.57	8	886	.130
A new course in environmental education	931	3.90	3.80	4.10	3.89	4.24	4.06	3.56	3.40	4.03	4.61	8	922	.000
Business Education	891	2.62	2.60	2.53	2.67	2.60	2.66	2.37	2.53	2.89	.89	8	882	.534
History	916	2.96	3.02	2.97	3.21	2.90	3.46	2.99	2.82	3.37	2.46	8	907	.012
Civics, Government, Political Science	923	3.24	2.60	3.29	3.65	3.52	3.92	3.35	3.30	3.71	3.17	8	914	.002
Geography	935	3.65	3.87	3.61	3.93	3.76	4.37	3.77	3.61	3.68	3.54	8	926	.001
Economics	921	3.35	3.39	3.35	3.29	3.67	3.87	3.53	3.50	3.53	2.17	8	912	.028
Physical Education	903	2.97	2.79	2.83	2.84	2.66	2.55	2.89	2.58	2.89	1.25	8	894	.263
Special Education	892	2.84	2.95	2.78	2.93	2.87	2.89	2.89	2.72	2.82	.332	8	883	.953

APPENDIX B

COPY OF QUESTIONNAIRE

MEMORANDUM

TO: Educators in the State of Tennessee

FROM: Dr. Richard K. Fletcher, Jr., Associate Professor
Department of Secondary Education and Foundations
Tennessee Technological University

Mr. Jack Rhoten
Science and Environmental Education
Kingsport City Schools

Mr. John Bennett
Science and Conservation Specialist
State Department of Education

RE: Attached Questionnaire - Status and Needs of Environmental Education in Tennessee

The authors request that you complete the attached questionnaire and mail it in the postage-paid pre-addressed envelope. We express our sincere appreciation for your assistance and believe that the results from this research study will be a contribution to state agencies, colleges and universities, and public schools. The results will be made available to any educator, institution, or agency that requests it. All results will be presented as group statistics such as to guarantee that no school system or person will be identified. The authors will present this information at the forthcoming National Convention of the National Science Teachers Association in Atlanta, Georgia. After this convention, it will be submitted for publication in an appropriate source.

The funds for conducting this survey of 3000 educators is being provided through a research grant from the Faculty Research Fund of Tennessee Technological University. The Board of Directors of the Tennessee Environmental Education Association has approved the investigation. The authors accept full responsibility for the investigation and neither the Tennessee Environmental Education Association, Tennessee Technological University, the State Department of Education, nor Kingsport City Schools has any formal responsibility for the study.

Thank you for your cooperation. We are hopeful that most of you will take the time to complete the instrument. If we can be of assistance to you in the area of science and environmental education, please notify us.

STATUS AND NEEDS OF ENVIRONMENTAL EDUCATION IN TENNESSEE

For each of the following items, please place the number representing your choice in the space at the left of the item. Please give ONE best answer. All answers will be treated confidentially.

___1. My present position in education is: (1) elementary teacher K-3 (2) elementary teacher 4-6 (3) middle or junior high school science teacher (4) middle or junior high school teacher of social studies (5) senior high school teacher of science 9-12 (6) senior high school teacher of social studies 9-12 (7) principal (8) supervisor of instruction (9) other (please specify)_____

___2. Do you believe environmental related problems indicate a need for teaching environmental education in public education? (1) yes (2) no

___3. I have studied environmental education in a college setting. (1) yes (2) no

___4. I have participated in workshops/inservice programs related to environmental education. (1) yes (2) no (If YES, please answer number 5)

___5. If yes, was financial assistance provided by one of the following? (1) NSF (2) HEW (3) other sources (4) none provided.

___6. The institution of higher education which I would most often utilize for continuing my educational training is: (1)APSU (2)ETSU (3)MTSU (5)TSU (6)TTU (7)UTC (8)UTK (9)UTM (10) other (please specify)_____

___7. Which pattern of environmental education best describes that USED in your school? (1) separate course or subject (2)integrated into other subjects (3)incidential instruction (4)not taught

___8. The State Department of Education in Tennessee should strongly encourage the development of environmental education programs in schools. (1) yes (2) no

Listed below are a number of DIFFICULTIES associated with teaching environmental education. Please indicate the degree to which you feel they are important problem areas by placing the number representing your choice in the blank at the left of the statement. The scale is as follows: Not Important 1 2 3 4 5 Very Important

average

___9. Insufficient room in our present school curriculum.

___10. Preparation of teachers in environmental studies.

___11. Lack of appropriate curriculum materials.

___12. Confinement of students in the classroom.

___13. Lack of acceptance by teachers.

___14. Lack of acceptance by the general public.

___15. Lack of support from state and other governmental agencies.

___16. Rigidity of the school schedule.

___17. Insufficient student interest.

___18. Present day stress on back to the basics and competency testing.

___19. Inadequate in-service training in environmental education.

___20. Potential legal problems associated with transporting and supervising students in out of school areas.

Which of the following discipline areas should receive the greatest emphasis in environmental education? Please indicate the degree to which emphasis should be in the areas by placing the number from the following scale in the blank at the left of the item.

No Emphasis 1 2 3 4 5 High Emphasis

average

___21. Art
___22. Music
___23. Health
___24. Biological sciences
___25. Physical sciences
___26. Earth sciences
___27. Mathematics
___28. Vocational industrial areas
___29. Vocational home economics and agriculture
___30. Sociology
___31. Language arts
___32. Literature
___33. A new course in environmental education
___34. Business education
___35. History
___36. Civics, government, Political science
___37. Geography
___38. Economics
___39. Physical education
___40. Special education

Please indicate which of the following types of environmental education activities your school is employing or has recently employed: Items 41-47.

___41. Field trips (1) yes (2) no

___42. Outdoor programs on school site (1) yes (2) no

___43. Residence center trips (1) Tremont (2) Land-Between-the-Lakes (3) others (4) None

___44. Summer camps (1) yes (2) no

___45. The extent your school uses films on environmental education. (1) 10 or more per year (2) 5-9 per year (3) 1-4 per year (4) none

___46. The extent your school uses resource persons in environmental education. (1) 5 or more per year (2) 2-4 per year (3) 1 per year (4) none

___47. At what level(s) should environmental education programs primarily focus? (1) elementary schools (2) middle or junior high schools (3) senior high schools (4) adult education (5) 1 thru 2 (6) 1 thru 3 (7) 1 thru 4.

If you wish to receive information relating to any of the following items, please indicate your choice and include your name and school adddress in the space provided.

___48. I would be interested in information relating to a new environmental education residence center being planned at Tech Aqua on Center Hill Reservoir. (1) yes (2) no.

___49. I would be interested in participating in a workshop/inservice program related to environmental education. (1) yes (2) no.

___50. In regard to the Tennessee Environmental Education Association, I am (1) presently an active member (2) aware of the organization but not a member (3) not aware of the organization but am interested in it (4) not interested in particpating in the organization at the present time.

NAME_____

SCHOOL ADDRESS_____

_____ZIP CODE_____